



LAGNIAPPE

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Stennis tests shuttle valves

Stennis Space Center engineers performed a series of space shuttle flow valve tests this month to provide critical data to NASA engineers working to set a date to launch Discovery on its STS-119 mission.

Discovery had been scheduled to launch Feb. 12. However, concern arose about a gaseous hydrogen flow valve. One of three such valves in the orbiter's main propulsion system did not operate properly during the launch of Endeavour last November.

The other two shuttle flow valves compensated without incident. However, a post-flight inspection showed the affected valve had cracked and sent a large piece of debris into the shuttle propellant systems.

NASA officials became concerned debris from a future incident might rupture gaseous hydrogen tubing. The call went out to three centers to begin testing aspects of the valve.

Engineers in Stennis' E Test Complex were tasked to configure the E-1 site to determine the danger posed by possible debris. "It was practical to do the testing here because we're the only facility that can handle the required amount of hydrogen needed for the testing that fast and can handle all the reconfiguration needed," said Nickey Raines, deputy chief engineer in the Stennis Engineering and Test Directorate.

Working 16-hour days, Stennis engineers began testing within days of the request and conducted dozens of flow valve tests. At press time, data from the tests were being evaluated and a Flight Readiness Review for Discovery was set for Feb. 18.

Flames burst from the E-1 Test Stand as Stennis Space Center engineers perform one of dozens of shuttle flow valve tests. Stennis engineers teamed with Innovative Partnership Program partners to perform the tests after NASA officials delayed the launch of the STS-119 mission because of concerns with the shuttle part.



Bill McArthur (right), a former astronaut who serves as safety and mission assurance manager at Johnson Space Center in Houston, talks with Maury Vander, a NASA engineer at Stennis' E Test Complex, during a Feb. 12 visit. McArthur toured the E Complex to thank team members for their work in conducting critical tests on a shuttle flow valve earlier this month.

A NASA Day of Remembrance

Stennis Space Center Director Gene Goldman (left) and Deputy Director Patrick Scheuermann place a wreath in StenniSphere in memory of the 17 astronauts lost in service of the space program since 1967. The wreath was placed during NASA's 2009 Day of Remembrance, observed each year on the last Thursday of January.



From the desk of
Patrick Scheuermann
 Deputy Director
 Stennis Space Center



*Change [chaynj] 1. to cause to be different.
 2. to give and receive reciprocally.*

This one word strikes fear in many people. Others embrace it. Still others stand by and watch it happen. Each of us, in our professional or personal lives, has experienced and worked through it one way or another. The Stennis team must realize that we experience change together and should be open to each other's thoughts and approaches to understanding and implementing it.

As a Stennis team, we have enjoyed more than 40 years of being on the front line of rocket engine testing. For Apollo, we certified stages that carried us to the moon. We currently certify the Space Shuttle Main Engines (SSME) for flight to keep the nation on the forefront of space preeminence. With the Constellation Program, we are on the critical path in leading the nation's efforts to get us back to the lunar surface for good and to travel beyond.

One could look at history and choose to point out the difficulties the Stennis team faced during the original construction, or during the crossover to successfully execute the SSME test program. Even today, as we modify facilities and perform tests in the A Complex and the E Complex, and build A-3 for the Constellation Program, one can feel overwhelmed. Our

founding purpose to test rocket engines and stages is solid and underpinning. One thing that remains constant amid changes we all experience in fulfilling that responsibility is our reliance on each other.

Our ability to communicate, to give and receive and to trust that other organizations or individuals will do their part, is at the very core of mission success. We each have an important stake to mission success. Each of us might have a different motivation that drives us to contribute. Realize there is a whole team around you that you can count on, reach over to, and partner with to be successful.

Whatever motivates each of us is brought together by our common and long-term purpose at Stennis to execute safely the rocket engine test program that will result in safe launch of our crews and cargo to the next frontier. We never should forget our rich history of success and certainly should learn from our losses. In January, we paid proper tribute to the Apollo 1, Challenger and Columbia crews. A recent report certainly reminds us of the risky line of business we are in. I would encourage each of you to read the Columbia report, which is online at http://www.nasa.gov/pdf/298870main_SP-2008-565.pdf.

A modern philosopher once said, "If you don't know where you are going, you will wind up somewhere else." Stennis Space Center, since its inception and for the foreseeable future, has a solid and clear forward direction.

Know that you are a critical part of the Stennis team. Keep forging ahead!



MSFC/European space personnel visit Stennis

Officials from NASA's Marshall Space Flight Center in Huntsville, Ala., the European Space Agency and the French Space Agency visited Stennis Space Center on Jan. 22. During the visit, they toured site facilities and test stands and witnessed a subscale dif-fuser test at the E Test Complex. At left, the visitors stand in front of the B Test Stand.



Goldman conducts All Hands meeting

Stennis Space Center Director Gene Goldman responds to a query during his first All Hands gathering as director. During the Feb. 6 session in StenniSphere, Goldman responded to numerous questions submitted by center employees. Among other things, he stressed the rocket engine testing center's value and continued focus on excellence.

FULFILLING NASA'S EXPLORATION MISSION

New tank insulation tested at Stennis

A project at NASA's John C. Stennis Space Center has demonstrated the effectiveness and value of a new technology: using glass bubble insulation to reduce boil-off in liquid hydrogen storage tanks.

The project could pave the way for increasing the efficiency of new cryogenic tanks and allowing the retrofit of old tanks, such as the ones at NASA's Kennedy Space Center in Florida that hold 850,000 gallons of the super-cold fuel. "The results of this project were absolutely what we wanted to see," said Jared Sass of Kennedy Space Center, co-principal investigator for the project. "We now know how to handle this type of insulation for a full-scale application, and we have confirmed the results we saw in lab testing."

The lab testing began in 2000 as researchers began exploring alternatives for insulating cryogenic tanks. Perlite – a natural mineral – has been used for decades. It does well in reducing heat flow into the minus-423-degree-Fahrenheit liquid hydrogen in a storage tank, but it has shortcomings.

With the temperature difference between outside air and the liquid hydrogen at more than 500 degrees, insulation is critical. Heat energy that passes through the insulation causes part of the liquid to boil. No insulation is perfect, which means some boil-off – or loss of product – naturally occurs in storage. However, increased boil-off translates to lost product – and money. With large tanks, the cost can skyrocket. "The equation is simple – the better the insulation, the less product you lose," Sass said.

Through lab testing, Kennedy researchers found glass bubble insulation could reduce boil-off by more than 30 percent. However, that testing was on tanks of about 230 gallons. To go from that to retrofitting an 850,000-gallon tank was "too big a jump to take," said Bill St. Cyr, co-principal investigator for the Stennis project. "We offered the opportunity to try out the new insulation on a larger scale."

Working through NASA's Innovative Partnership Program, Kennedy and Stennis engineers teamed with 3M and Technology Applications Inc. for the retrofitting effort.

"Without IPP and companies to share the cost, this project would not have happened," Sass said.

"This approach worked out to be a win/win," Stennis IPP Project Manager Ramona Travis agreed. "Stennis is benefiting from reduced fuel loss and associated cost savings, Kennedy may realize much larger savings with their huge tanks, and 3M is able to demonstrate commercial value for this insulation product in a new market area," she said.

Last fall, the perlite insulation was removed from the Stennis tank and replaced with glass bubbles. Stennis personnel then closed the system, refilled the tank with liquid hydrogen and began to record the daily boil-off.

The numbers proved the lab theory. Boil-off appears to be 50 gallons

per day when the tank is three-fourths full. The perlite tank had been experiencing a daily boil-off of 100 gallons. That translates to a savings of more than \$70,000 a year. On an 850,000-gallon tank, the savings would figure to be much greater. A change to glass bubbles on a tank could pay for itself in two to 10 years, Sass said.

At Kennedy, engineers already know they have a boil-off problem on the Launch Pad B tank, whose insulation has not performed as well as that of the Launch Pad A tank. Now, as Pad B transitions to the Constellation Program, engineers have to decide whether – and how – to address the problem, Sass said. Options range from simply accepting the boil-off to doing a complete glass bubble retrofit.

Engineers operating other large cryogenic tanks across the country now have a wider array of options for addressing their own insulation-related performance issues. Glass bubble insulation also is a viable option for new storage vessels, including the massive tanks – perhaps as large as 2 million gallons – that may be built to support NASA's Ares V rockets to send humans back to the moon and possibly beyond, Sass said.

"There are still some things to determine, such as how the glass bubbles perform over a longer period of time," he said. "But beyond that, the testing at Stennis answered a whole lot of big questions for us."



A tanker truck delivers glass bubbles to workers at the liquid hydrogen storage tank at Stennis Space Center. Workers recently replaced existing insulation in the tank with glass bubbles in a successful test of their effectiveness for cryogenic storage.

Stennis Space Center



Kent Ladner (left) and Chad Albritton, both of Applied Geo Technologies Inc. calibrate flow computers at the A-2 Test Stand.

Day in and day out, NASA's John C. S...
Work always is under way somewhere...
test complexes. Even when te...
Stennis employees are busy y...
and modifications. Meanwhile, even a...
native wildlife engaged



Jerry Hanna of Jacobs FOSC paints the deflector structure on the A-2 Test Stand.



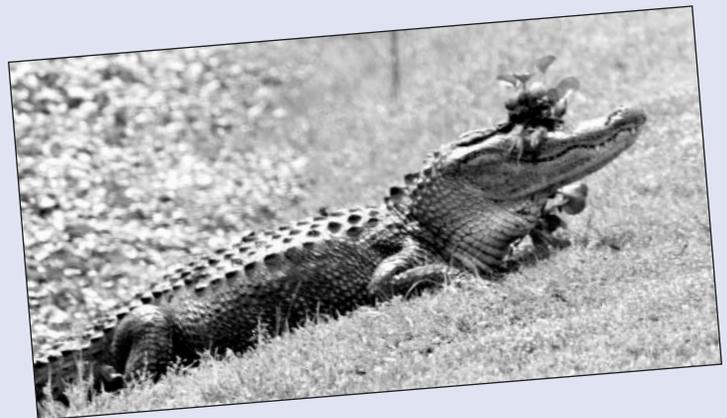
Robert Hayward of Jacobs FOSC descends beneath the B-1 Test Stand to perform maintenance.



(L to r)
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Mike Johnston of Jacobs FOSC paints the deflector structure on the A-2 Test Stand.

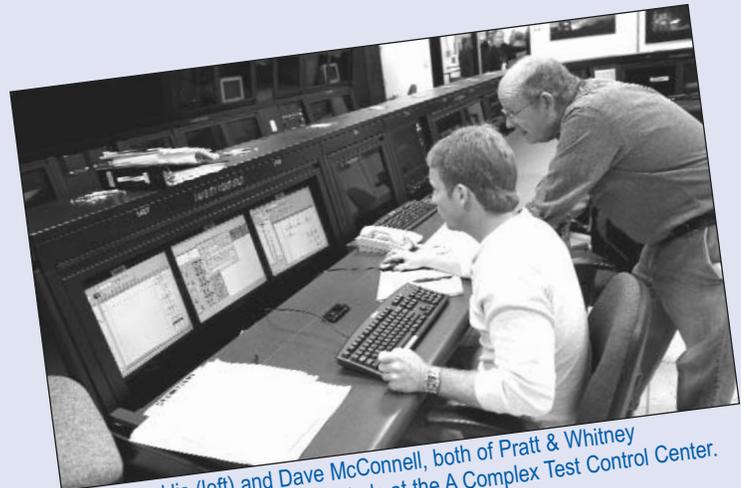


r – all in a day's work

Stennis Space Center is a busy place. Here, especially at the rocket engine tests are not being conducted, with in assorted maintenance a casual look around the site reveals in their daily activities.



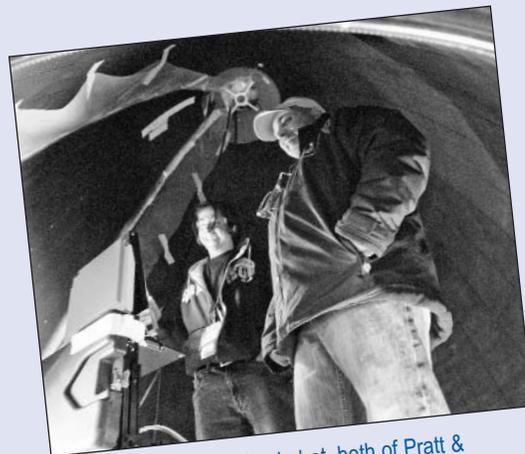
Kanaly Slade, Pat Guidry and Danny Tarter, all of Jacobs NTOG, make adjustments to the chemical steam generator installed on the E-2 Test Stand.



Eric Vanderklis (left) and Dave McConnell, both of Pratt & Whitney Rocketdyne, monitor system controls at the A Complex Test Control Center.



Welder Jackie Ladner of Jacobs FOSC makes repairs to the flame bucket on the A-1 Test Stand.



Joel Perez (left) and Jay Labat, both of Pratt & Whitney Rocketdyne, are in close quarters as they check for leaks inside the nozzle of a space shuttle main engine mounted on the A-2 Test Stand.



Douglas Haralson of Jacobs FOSC applies paint on the engine deck of the A-1 Test Stand.

Henry Auter Jr. – a true space pioneer

Editor's Note: NASA's John C. Stennis Space Center has played a pivotal role in the success of the nation's space program. Each month, Lagniappe looks back on important moments in the center's history.

Henry Fenimore Auter Jr. made his mark on the history of NASA's John C. Stennis Space Center during a tenure that spanned nearly two decades.

Auter, a NASA electrical engineer, was named deputy manager of the Mississippi Test Facility in 1963. He served in that capacity until his retirement in 1980 at the then-renamed National Space Technology Laboratories.

He made many contributions to the installation as a manager, planner and engineer. From 1975 to 1976, Auter served as acting manager of the facility and oversaw the testing of the Saturn V first and second stages.

Auter continued to be involved with the center and the space program as a consultant and adviser until his death on Feb. 11, 1991.

At that time, former Stennis Space Center historian Mack Herring described his good friend and business associate as a true space pioneer.

"Henry and I had been working together since last August, writing a history of the Stennis Space Center," Herring said. "Although we had been good friends and working associates for 28 years, the history project gave me an even better opportunity to know this quiet giant of a man."

Auter began his career at the site during the construction of south Mississippi's rocket engine testing facility. He



NASA/MTF Deputy Manager Henry Auter (right) briefs visiting astronauts John Young (left) and Charles Duke atop the S-IC test stand. The astronauts visited what was then NASA's-Mississippi Test Facility on Sept. 16, 1969, to express their admiration for test site workers who were victims of Hurricane Camille on Aug. 17, 1969. The two astronauts toured part of the Gulf Coast in a helicopter before arriving at the test site to talk to workers.

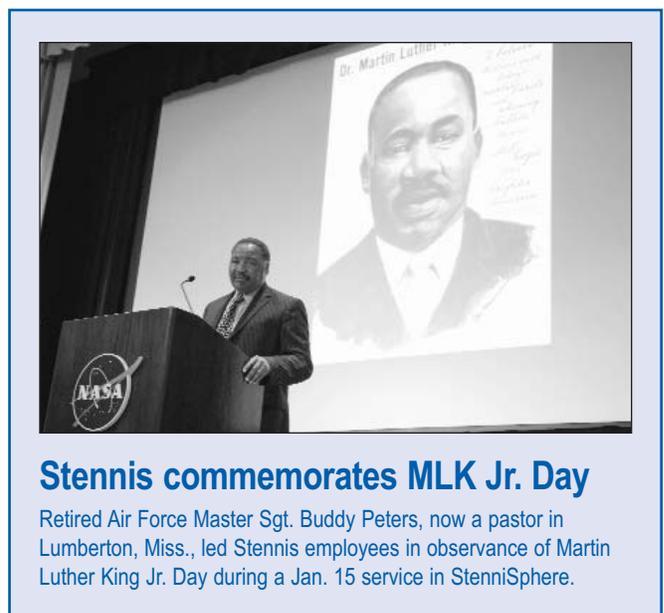
worked tirelessly alongside those who tested the engines that would take astronauts safely to the moon. He was at Stennis as the center's mission changed to the testing of space shuttle main engines. Now, as the center begins the transition to NASA's Constellation Program, it is important to remember Herring's final words about his colleague and friend.

"Perhaps Henry's greatest contributions are yet to come, because this humble man's legacy of a useful and positive life of service will surely be passed to future generations," Herring said. "That would be the greatest memorial that we could lay up for Henry, our colleague and above all, our friend."



Business council visits Stennis

Members of the NASA Small Business Council visited Stennis Space Center on Jan. 27, touring various facilities, including the CHL Visualization Lab and the Remote Sensing Lab. During the daylong tour, the NASA visitors also had the opportunity to tour the A-1 Test Stand and to view an RS-68 engine test on the B Test Stand.



Stennis commemorates MLK Jr. Day

Retired Air Force Master Sgt. Buddy Peters, now a pastor in Lumberton, Miss., led Stennis employees in observance of Martin Luther King Jr. Day during a Jan. 15 service in StenniSphere.

Enrich your world – celebrate diversity

Diversity as a concept focuses on a broader set of qualities than race and gender. In the context of the workplace, valuing diversity means creating a workplace that respects and includes differences, recognizes the unique contributions that individuals with many types of differences can make, and creates a work environment that maximizes the potential of all employees.

From the
**Office of
Diversity
and Equal
Opportunity**

- Age.
- Family life (values, family size, etc.).
- Religious, spiritual or philosophical beliefs.
- Income or social status.
- Sexual orientation.
- Physical and mental abilities.
- Life experiences.
- Educational background.

For centuries, American education, business and government have reflected the culture of the vast majority: white people of European descent. In recent years, however, we have seen big changes. It is estimated that by 2014, of every 100 workers:

- 21 will be 55 or older.
- 36 will be Hispanic American, African American, Asian-Pacific American or other people of non-European descent.
- 47 will be women.
- 35 will be white men.

(Source: U.S. Bureau of Labor Statistics. Note: Total is more than 100 because women of non-European descent and workers older than 55 are counted twice.)

Many things make each of us an individual. Some examples of these are:

- Appearance (gender, body size, skin color, hairstyle, clothing, etc.).
- Ethnicity and culture (customs, traditions, language, etc.).

Celebrate diversity! Take pride in your uniqueness. Welcome others as individuals with special qualities. Enjoy your similarities – and your differences. When you appreciate diversity, you enrich your world.

Hail & Farewell

NASA bids farewell to the following:

Richard Mann	Contract Specialist Office of Procurement
Mattie Kirschenheuter	Secretary Office of External Affairs

And welcomes the following:

Keith Brock	Director Project Directorate
Dao Kooamphorn	Contract Specialist Office of Procurement
Dwana King	Student/Environmentalist Center Operations

@ Stennis

What would be a good way to inspire the public about the Constellation plan to go back to the moon?

Editor's Note: @ Stennis is a monthly feature highlighting the views and opinions of Stennis Space Center employees.



“We need more public displays, like having the lunar rover in the Inauguration Parade. That way we actually show people how we are preparing to go to the moon.”

Bernadette Duet
Computer Sciences Corp.

“We need to try something similar to what they did in the Apollo days. We just need a lot of PR about the program and where it’s going.”

Jay Labat
Pratt & Whitney Rocketdyne



“We need more interactive experiences for people – like high-def, real-time video so people can know what’s happening. But definitely more interactivity.”

Leonard Scardino
Planning Systems Inc.

“We need to get the schools involved, really get the kids interested and excited. Then, they’ll go tell their parents about it.”

Dawnyel Stuart
ASRC, MS



Astro Camp missions to focus on moon

Astro Camp participants will celebrate the 40th anniversary of the Apollo 11 lunar mission this summer by going back to the moon.

In addition to engaging in activities to bring that historic mission to life, children ages 7-12 will investigate the future of lunar exploration. They will focus on such questions as what it would be like to live on the moon for months at a time, whether they could grow their own food there and how a lunar stay would affect their bodies.

It all is part of the 2009 theme – “Another Giant Leap: Apollo Pioneers.”

Astro Camp summer sessions for children ages 7-9 are scheduled for June 1-5, June 15-19, June 22-26, July 6-10 and July 13-17.

Astro Camp summer sessions for children ages 10-12 are set for June 15-19, June 22-26, July 6-10, July 13-17 and July 20-24.

The summer camp fee is \$150 per participant, which includes a camp T-shirt, supplies and daily snacks. Participants will need to bring their own lunches, and daily sessions run from 8:15 a.m. to about 4 p.m.

To reserve a place in a summer camp

session, fill out an Astro Camp Registration Form and mail it with a \$50 deposit to: Astro Camp Registration, Building 1200, Stennis Space Center, MS 39529.

Applications will be confirmed when deposits are received. Money orders or checks should be payable to Jacobs Technology Inc. The balance of the fee is due on the first day of camp.

To download a registration form or obtain additional information, visit <http://education.ssc.nasa.gov/astro-camp-schedule.asp>. For information, persons also may call 228-688-7623 or 800-237-1821, Option 4.

Scholarship deadline set

The NASA College Scholarship Fund has announced its 2009 agencywide call for applications. NCSF awards scholarships to qualified dependents of former and current NASA employees. Up to six scholarships will be awarded in the amount of \$2,000 each. Each scholarship is renewable for a maximum of \$8,000 over a period of six calendar years. The deadline for applications is March 20.

All applicants must have a high school diploma or be enrolled in a college. An applicant must have a combined high school and college grade point average of 2.5 or greater on a 4.0 scale.

Information and materials are available online at <http://nasapeople.nasa.gov/nasascholarship/index.htm>. For additional details, call Joy Smith, program manager, at 228-688-2118.



USRP students begin term at Stennis

Five NASA Undergraduate Student Research Project interns recently arrived for a 15-week term working with research and engineering mentors at Stennis Space Center. They are (l to r): Justin Milan (University of Florida in Gainesville), Luke Richards (Colorado School of Mines in Golden), Aaron Hawkins (Iowa State University in Ames), Jimmie Baker (Alcorn State University in Lorman, Miss.) and Clayton Thurmer (Oberlin College in Oberlin, Ohio).

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